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Work and active aging : is there a relationship between health and meaning in life?

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Table I – Measurement scales, reliability and dimensionality statistics

Variable	Items[a]	Factor Loading	Mean	SD	CR (AVE)	Cronbach Alpha
Values at Work (VW) and Leadership (L) (VW_L)	VW1: Is your work recognized and appreciated by the management?	0.718***	2.40	1.061	0.952 (0.712)	0.912
	VW2: Are you treated fairly at your workplace?	0.781***	2.33	1.090		
	VW3: Can the employees trust the information that comes from the management?	0.683***	2.07	1.014		
	VW4: Does the management trust the employees to do their work well?	0.741***	2.07	0.998		
	VW5: Are conflicts resolved in a fair way?	0.828***	2.52	1.026		
	VW6: Is the work distributed fairly?	0.811***	2.57	1.051		
	L1: If you should need it, how often would your immediate superior be willing to listen to your problems at work?	0.783***	2.50	1.235		
	L2: If you should need it, how often would you get help and support from your immediate superior?	0.762***	2.66	1.229		
Work Organization (WO) and Job Contents (JC) (WO_JC)	WO1: Do you have a large degree of influence on the decisions concerning your work?	0.743***	2.47	1.252	0.896 (0.684)	0.904
	WO2: Can you influence the amount of work assigned to you?	0.747***	2.74	1.243		
	JC1: Do you have the possibility of learning new things through your work?	0.736***	2.21	1.128		
	JC2: Does your work require you to take the initiative?	0.752***	2.00	1.069		
Quantitative Demands (QD)	QD1: Do you get behind with your work?	0.806***	3.94	0.969	0.852 (0.742)	0.880
	QD2: Do you have enough time for your work tasks?	0.765***	2.36	1.136		
Work Pace (WP)	WP1: Do you have to work very fast?	0.901***	2.66	1.111	0.947 (0.899)	0.901
	WP2: Do you work at a high pace throughout the day?	0.914***	2.76	1.133		
Stress (S) and Burnout (B) (S_B)	B1: How often have you felt worn out?	0.873***	3.11	0.887	0.956 (0.845)	0.887
	B2: How often have you been physically exhausted?	0.897***	3.25	0.929		
	S1: How often have you been stressed?	0.882***	3.19	0.978		
	S2: How often have you been irritable?	0.803***	3.32	0.900		
Meaning in Life (ML)	ML1: I am usually bored	0.743***	5.17	1.594	0.924 (0.753)	0.803
	ML4: My personal existence is utterly meaningless without purpose	0.816***	5.77	1.514		
	ML6: If I could choose, I would prefer never to have been born	0.785***	6.29	1.502		
		0.831***	6.11	1.525		

	ML9: My life is empty, filled only with despair					

***p-value < 0.001; a – items with factor loading < 0.5 was eliminated; standard deviation (SD); composite reliability (CR); average variance extracted (AVE).

Table II –Discriminant Validity

Variables	**AVE**	QD	WP	WO_JC	VW_L	S_B	ML
Quantitative Demands (QD)	**0.742**	**0.861**					
Work Pace (WP)	**0.899**	0.154	**0.948**				
Work Organization and Job Contents (WO_JC)	**0.684**	-0.221	0.395	**0.827**			
Values at Work and Leadership (VW_L)	**0.712**	-0.305	-0.072	0.278	**0.843**		
Stress and Burnout (S_B)	**0.845**	0.342	0.245	-0.131	-0.237	**0.919**	
Meaning in Life (ML)	**0.753**	0.220	-0.015	-0.257	-0.261	0.468	**0.867**

Note: Numbers in diagonal represent square root of average variance extracted; values above the diagonal represents the correlation of constructs and all are significant at the 0.01 level (bilateral)

Table III – Path Estimate and Conclusions

Path Hypotheses	B	SE	t	Conclusion
H1: Quantitative Demands → Stress and Burnout	0.173 [0.029;0.317]	0.072	7.342***	Accept
H2: Work Pace → Stress and Burnout	0.356 [0.3;0.412]	0.028	5.570***	Accept
H3: Work Organization and Job Contents → Stress and Burnout	-0.130 [-0.21;-0.05]	0.040	-4.048***	Accept
H4: Values at Work and Leadership → Stress and Burnout	-0.152 [-0.222;-0.082]	0.035	-5.025***	Accept
H5: Stress and Burnout → Meaning in Life	0.648 [0.552;0.744]	0.048	12.993***	Accept

Work and Active Aging: is there a relationship between Health and Meaning in Life?

Abstract

Purpose - This study aims to explain the health impact of work demands and organization, job content, leadership and values in the workplace. It also explores the extent to which health conditions influence meaning in life in late career.

Design/methodology/approach - The sample consisted of 1330 Portuguese-based individuals aged 55-75 years. The structural equation modelling was used for the data analysis and to test research questions.

Findings - The results showed that stress and burnout are influenced by work demands and organization, job content, leadership and values in the workplace. Health status affects meaning in life.

Research limitations/implications – Although participants were asked to answer the questionnaire bearing in mind their last work experience, retirees could have had difficulty reporting on their last work, therefore, in future research, the use of a qualitative methodology could also be equated, as to complement richer information regarding past experiences in the work context.

Practical and social implications -

Considering the main goals of the United Nations 2030 Agenda for sustainable development, this study contributes, namely, to the 3rd one – Ensure healthy lives and promote well-being for all at all ages. In fact, directing a look at the condition in which older people work and at their health, contributes not only to more productive organizations, to less spending of public money on health, but also to a more inclusive society. Bearing in mind workers are progressively retiring later and that the exposure to certain work conditions during the late career is problematic for organisations and for society in general, this study has practical and social implication**.**

Originality - Considering demographic changes and the aging of the active population in Portugal and the scarce studies carried out in the country concerning this relevant theme, we believe that the conclusions may constitute an important input for workplace policies regarding older workers. In addition, little research has focused on the effect of health in meaning in life.

Keywords - Working conditions, Active aging, Stress, Burnout, Meaning in life.

Paper type – Empirical research paper.

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Introduction

Organizational psychology research in the past four decades has focused on the relationship between work and health (Pisanti, Montgomery and Quick, 2017), among other. For its part, the European Union has been displaying growing concern about health at work. Studies into the actively working population have now become more regular, and have led to publications, with multiple indicators, such as the European Working Conditions Survey (EWCS) reports. Although the results may contain some bias based on the multidimensional character of health indicators in the workplace (Lasfargues, 2005), due to the fact that the respondents will possibly be among the healthiest in the population (which is why they are not absent from the workplace) and also because the answers may reflect the social desirability phenomenon, the EWCS' continue to report increased exposure to health risks, such as hight work intensity and emotional demands (Eurofound, 2019). At the same time, there are large asymmetries regarding factors such as gender, age, the nature of the work activity, the work sector and the countries concerned. These can be explained, on the one hand, by prevailing notions of division of labour, for example, based on stereotypical views of older workers or women's capabilities (Volkoff, 1997) and, on the other hand, the employment and social protection policies in each country. Indeed women, who are globally more involved in the education and health sectors, are particularly exposed to psychosocial risks, that is, high emotional demands, which are associated with poorer health indicators (Eurofound, 2019). Similar discrepancies are evident based on generational cohort. For example, a study carried out in Portugal in the banking context (Torres, 2006) showed that managers loaded younger people more heavily than older generations with commercial responsibilities, high workload and longer working hours, which, together with low autonomy, systematic exposure to change, monotony and feelings of job insecurity, led to higher stress levels. A comparative study of nurses in Portugal and Spain (Baldonedo *et al*., 2018) also showed that, in the Spanish sample, age was negatively correlated with stress. In the context of health professionals, Marôco, Marôco, Leite, Bastos, Vazão and Campos (2016) observed higher levels of burnout in younger doctors and nurses. Corroborating these results, Souza, Helal and Paiva (2017) concluded that young workers are more at risk of burnout. In a further examination of burnout, significant differences were recognized by Hakanen and Bakker (2016) in various socio-demographic variables, such as gender, age and socioeconomic status.

Despite these differences, exposure to psychosocial risks is transversal across different socio-professional categories, with work intensity, high competition and weak confidence in work groups being the main factors that cause malaise in the workplace (Thébaud-Mony, Davezies, Voguel and

Volkoff, 2015). This issue deserves particular attention, given that the effects of stress on health and quality of life are unquestionable, triggering, among other, premature aging (Sadir and Lipp, 2009).

At a time when average life expectancy is increasing and some workers increasingly find it imperative to work until later in life, it is important to guarantee quality of life and recognize the factors that contribute to active aging. According to the WHO (2002) "active aging is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age". Underlying this definition is the concept that an active person is someone who maintains autonomy and independence and is involved in various work-related activities.

Studies have demonstrated a link between meaning in life and perceived levels of stress. In the study developed by Park and Baumeister (2017) it was found that people who had lower levels of meaning of life or where this meaning had been threatened, display greater stress than those who reported having a greater one. On the other hand, the anticipation of future stress causes people to search for meaning in life, which can be seen as a protective factor against stress. Although some authors have suggested that some negative life experiences may serve as opportunities to reinforce the meaning in life (Vohs, Aaker and Catapano, 2019; Russo-Netzer, Sinai and Zeevi, 2019), in general it is recognized that favourable experiences provide this reinforcement. One of the important areas when analyzing this relationship is work.

Despite the considerable number of studies that have assessed the impact of the meaning of life on health, we are unaware of any that assess the opposite. Thus, we believe that this study, whose goal is to assess the extent to which health is a factor that promotes meaning in life, could make a significant contribution to the literature.

Research should take into account the goals presented in the United Nations 2030 Agenda for sustainable development (United Nations, 2015), the following are especially relevant to the present manuscript, the goal 3 "Ensure healthy lives and promote well-being for all at all ages" and the goal 8 "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (United Nations, 2015, pp14).

In the present study we aim to understand the health impact, namely, stress and burnout,of (1) demands at work (quantitative demands and work pace); (2) work organization and job content (influence at work and possibilities for development) and (3) leadership and values in the workplace (social support from supervisors, recognition, trust in management, and justice) (Pejtersen, Kristensen, Borg and Bjorner, 2010).

The present study is divided into six parts. The first three focus on the main conceptual constructs underlying the study, relating work, psychosocial risks, health, active aging and meaning in life, and which lead us to formulate five hypotheses and well as the model design. The fourth part describes the methodology, the participants, the measurement instruments and the procedure. The fifth presents the

results of the exploratory and confirmatory factor analyses together with an estimation of the structural equation model. Finally, we present the discussion, outline the limitations of the study and make suggestions for future research.

Work, Psychosocial Risks and Health

Due to the growing, multiple and complex challenges that employees face in the workplace, new issues have arisen in terms of work organization and management; this is reflected in the emergence of psychosocial risks that can affect workers' health and safety. Some of these conditions are related to high quantitative and emotional work demands, intense work rhythms, low decision latitude, poor relationships with peers and managers, and job insecurity, among other issues. Many studies have shown the effects of exposure to harmful working conditions on health, such as stress and burnout, in different sectors and professions.

Lazarus and Folkman (1984, p.21) defined stress as "the relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being".

Maslach and Jackson (1981) defined burnout as "exhaustion syndrome"; this syndrome leads individuals to experience physical and emotional exhaustion, depersonalization and cynicism, a lack of personal fulfilment, devaluation and personal ineffectiveness. Hakanen and Bakker (2016, p. 1) described burnout as "a response to prolonged stressors at work, and is defined as a chronic syndrome including exhaustion, cynicism, and reduced professional efficacy".

Despite the recognized differences between these constructs, some authors, such as Ferreira (2015), argued that the results of burnout assessments are closely related to the results of stress assessments. In fact, an increase in stress is often accompanied by depressive symptoms, such as sadness, low self-confidence and self-esteem, lack of interest in daily activities, among others, and which, if experienced for a long period of time, may lead to emotional exhaustion. In particular, prolonged exposure to excessive workload has been recognized as a cause of emotional exhaustion, mainly because it places workers in a position that prevents them from meeting professional challenges (Maslach and Leiter, 2008). According to Spector and Jex (1998, cited in Casper, Sonnetag and Tremmel, 2017, p. 798), high workload "refers to having a great amount of work to do in too little time".

A study carried out with nurses in Ghana, by Kokoroko and Sanda (2019), identified the effect of high levels of workload on stress. In the context of knowledge workers, Albertsen, Rugulies, Garde and Burr (2010) also found that quantitative demands were positively associated with stress symptons, particularly in cognitive stress.

Other studies, with very different samples, establish the connection between work pace and health, namely that of negative stress. Macky and Boxall (2008) conclude that work intensity and a high-performance work system cause more stress. When referring to a research conducted with ICT workers, Evenstad (2018), highlights the consequences of acceleration as constant time pressure and work intensification in stress and burnout, as well as in the promotion of work-family conflicts.

An interesting research conducted among musicians into the Danish symphony orchestras, reveal that adverse psychosocial work environment, i.e. work pace, was strongly and positively associated with stress symptoms (Holst, Paarup and Baelum, 2011). A relation between work pace, stress, and cumulative trauma disorders was found by Arndt (1987).

Finally, a study carried out with German babyboomers (Tophoven, Tisch, Rauch and Burghardt, 2015), also came to the conclusion that increasing work pace is negatively related to mental health.

Based on the above, we formulate the following hypotheses:

H1: Participants exposed to prolonged high quantitative work demands report high levels of stress and burnout.

H2: Participants exposed to prolonged high work pace report high levels of stress and burnout.

According to the JD-C (job-demand control) model (Karasek, 1979; Karasek and Theorell, 1990), stress and burnout are caused not only by high demands at work, such as quantitative demands and work pace, but also by low decision latitude, which is associated with low control in the workplace. The JD-R (job-demand resources) model (Bakker, Demerouti and Euwema, 2005; Bakker and Demerouti, 2016; Taris and Schaufeli, 2016), in addressing various types of jobs, with different demands, requirements and constraints, proposed that job resources, be they physical, psychological, social or organizational, may buffer the impact of job demands, and thus reduce stress and burnout effects. Bakker, Demerouti and Euwema (2005) argued that autonomy in the workplace is a decisive factor, in that it enables workers to decide when and how to deal with job demands.

Some studies have emphasized the role that meaningful work has as a predictor of mental health outcomes, such as stress, inasmuch that work can promote personal growth (Allan, Dexter, Kinsey and Parker, 2016). The opportunity to develop knowledge and skills through one's working life seems to be determinant for health and well-being.

Based on the above, we formulate the following hypothesis:

H3: Participants who report having more influence over their work, as well as opportunities to learn and develop, report lower levels of stress and burnout.

There is extensive literature on the role that leadership, that is, the perception that one is supported by one's supervisor, recognition, confidence in management and feelings of justice, play in health. Bakker,

Demerouti and Euwema, (2005) demonstrated that the quality of the relationships that workers have with their supervisors, measured through, for example, communication and feedback processes, has a buffering effect on the impact of workload on health. In a study conducted on a sample of university professors, García, Inglesias, Saleta and Romay (2016) identified the lack of leadership qualities on supervisors as one of the most decisive factors affecting health. Kokoroko and Sanda (2019) concluded that support from supervisors contributes to more effective workload management and lower stress levels.

Siqueira and Pavadom (2008) defined well-being at work as a psychological dimension to some extent associated with the quality of social relations established with supervisors in the work environment. Yang et al. (2015) also suggested that support from supervisors had a direct effect on work-related stress, which is one of the main psychosocial risk factors in some professional contexts (García, Inglesias, Saleta and Romay, 2016).

Organizational support and empowerment were also recognized by Román-Calderón, Krikorian, Ruiz and Gaviria (2016) as important in helping employees perceive greater meaning in their work and feelings of greater competence. As we will try to demonstrate, when employees' feel there is meaning in their work, this has a positive effect on their health.

The concept of "… organizational justice as meaning the employees' perception of impartiality and equality in their workplace" (Greenberg, 1990; Topa and Morales, 2006, cited in García-Guiu, Molero and Moriano, 2015, p.62), has been studied for its role, not only in group cohesion and organizational identification, but also as a mediating variable. Some studies (Jensen and Luthans, 2006; Kiersch, 2012) have concluded that leadership, particularly authentic leadership, that promotes a positive organizational climate, anchored in relationships of trust and respect for fundamental ethical principles, such as justice, plays a decisive role in the well-being of employees.

Leadership has also been studied with regard to engagement. Although they are not considered opposites, engagement and burnout seem to correlate negatively (Shaufelli and Bakker, 2004). Some studies have demonstrated how leadership influences the meaning credited to work (Ward and King, 2017). In a sample of diverse professionals, Sadir and Lipp (2009) identified not only overwork, but also difficulty in dealing with their hierarchical superior and lack of recognition among the main sources of work related stress.

Gonçalves, Vilela, Terra and Nogueira (2016), based on the work psychodynamics approach of Christophe Dejours, identified recognition in the workplace as one of the main causes of feelings of any pleasure that employees might experience at work, and as being associated with good mental health.

In view of the above, we present the following hypothesis:

H4: Participants who feel recognized at work, who perceive they are supported by their supervisor, who trust their management and experience a fair organizational environment, report lower levels of stress and burnout.

Work, Health and Meaning in Life

The concept of meaning in life was introduced by Frankl (2004) in the 1940s. In essence, it is the way in which a person positions themselves in relation to their past and how they project themselves in the future, through a dynamic and personal assessment of the degree of coherence experienced in the present moment. For Frankl (2004) this assessment is continuous and may lead one to experience an "existential void", which can cause mental health problems.

Various definitions of the meaning in life construct have emerged over time. Nonetheless, some authors, such as Ward and King (2017), have recognized the existence of three common components: (1) Purpose in life, that is, the possibility of pursuing goals; (2) Significance, that is, the perception that one, and one's role, are valued by others; and (3) Coherence in relation to one's surroundings, that is, the achievement of harmony between oneself and the world. These three components are decisive in the work context since, as Davezies (1998) highlights, it is through work that humans structure their own existence, discover themselves, and test their limits. Thus, the recognition of purpose, coherence and significance at work create the impression in the employee that their work is meaningful (Ward and King, 2017). However, the specific impact that work has on meaning in life does not yet seem to be fully understood (Ward and King, 2017), despite the increase in studies that have sought to explain their relationship. Work is central to human existence and it has been argued that it has a great influence on the meaning in life, insofar as carrying out a meaningful activity creates coherence and personal appreciation which, on the one hand, can promote satisfaction and engagement and, on the other, can lead to lower stress levels. For example, Fairlie (2011), Lips-Wiersma and Wright (2012) and Steger, et al. (2012) (cited in War and King, 2017), showed that there was an inverse relationship between meaningful work and some negative well-being outcomes, such as burnout.

In the health sector, Gregersen, Vicente-Höper and Nienhaus (2016) showed that access to resources, including the possibility of being involved in meaningful work, and experiencing positive leader-employee relationships, are associated with lower levels of emotional exhaustion.

It is a fact that the literature profusely explores the protective effect of the meaning of life in the management of stress and burnout, in multiple professions, namely those that are more exposed to psychosocial risks. Even though the relationships between the meaning of life of older individuals, health indicators and satisfaction with life (Shiah, Chang, Chiang, Lin and Tam, 2015) are known, we wonder if these indicators could also interfere with the way the subject pursues goals, how they value their role and the way they perceive that they are valued by others, as well as the harmony they find

between themselves and the world (Ward and King, 2017). As Brühlmann (2013, p.521) highlights, "Burnout is also a meaning of life crisis, triggered by the narrowing of performance and success".

In a study conducted by Ben-Itzak et al (2015) the conclusion that meaning of life is a predictor of burnout was recorded. Authors developed a regression analysis that showed two significant factors associated with burnout: worry and a sense of existential meaning. Many professionals experiencing burnout revealed high emotional exhaustion, high depersonalization, and a low sense of personal accomplishment.

Thus, to test the relationship between stress and burnout and meaning in life, we make the following hypothesis:

H5: Participants who show lower levels of stress and burnout report more meaning in life.

Method

Participants

This study was carried out among 1330 Portuguese participants, from various parts of the country, including north, center, south and islands. The participants ranged between 55 and 75 years old, with the average age roughty being 60 years old. As to gender, 62% were female and 38% male.

The inclusion criteria were active or retired participants with or without a professional activity. Of the respondents, 47% were active, 46 % retired, and 7% retired but with an occupation. The professional activities were linked to education, health, public and domestic services.

The inclusion of retirees in the sample is based on the idea that the exposure to certain conditions during their "active working life" could have an impact on health later on. This can be explained by the concept that of work "delayed effects" may have on people's health. As several authors argue (Gollac & Volkoff, 2000; Volkoff 2005; Davezies, 2001), prolonged exposure to certain risks, such as those of a psychosocial nature, is not always accompanied by immediate effects but, conversely, these are experienced later. This means that, although, for example, a worker has been exposed in the last stage of his career to adverse working conditions (such as a high workload, high emotional demands, ...), he may suffer from health problems during retirement, such as anxiety or sleep disorders. In fact, longitudinal studies reveal the long-term effects of exposure to work-related stress and other psychosocial risks of work (Havermans, et al, 2018). Physical, psychological, and social health impacts, notably work-related stress and psychosocial risks at work are associated with heart disease, depression, and musculoskeletal disorders (MSDs) and there is consistent evidence that high job demands, poor control, and an imbalance between effort and return are risk factors for mental and physical health problems.

Finally, several studies (e.g. Cheng, Chen, Chen, Burr & Hasselhorn, 2013) show that effects of age on the associations between psychosocial conditions and health are moderate.

Considering these arguments and the fact that retirees were asked to fill in the survey bearing in mind their last professional experience, the authors find the sample appropriate.

Measurement instruments

The questionnaire included the following components: 1. Sociodemographic questions 2. Psychosocial factors at work 3. Meaning in life.

1. Sociodemographic questions: age, gender, employment status.

2. Psychosocial Factors at Work (COPSOQ II)

The present study used the Portuguese short version of the COPSOQ II (Silva *et al.*, 2011) – Copenhagen Psychosocial Questionnaire. The COPSOQ was developed and validated by Kristensen, Hannerz, Hogh, and Vilhelm (2005) in collaboration with the Danish National Institute of Occupational Health (Copenhagen) and its main objective is to evaluate psychosocial factors at work. It consists of 40 items assessed on 5-point Likert-type scale: 1 - Never / hardly ever; 2 - Rarely; 3 - Sometimes; 4 - Often; 5 - Always; or 1 - Nothing / almost nothing; 2. A little; 3 - Moderately; 4 - Very; 5 - Extremely.

The COPSOQ II choice was mostly due to the fact that this is a widely used instrument, with its shorter version being the most attractive from the participants standpoint (Kristensen et al., 2005). Likewise, as the COPSOQ is an instrument developed by several independent scales, and based on guidance from the ethics committee, the scale regarding violence at work was removed. These items are normally placed at the end of the instrument and therefore do not influence the normal filling out of the instrument.

The final version of the questionnaire used in this study included 36 items measuring the following dimensions: 1. Demands at work (quantitative demands, work pace, emotional demands), 2. Work organization and job content (influence, development opportunities, meaning of work, commitment to the workplace) 3. Interpersonal relations and leadership (predictability, recognition, role clarity, quality of leadership, social support from supervisor) 4. Work-individual interfaces (job satisfaction, work-family conflict) 5. Values at workplace level (trust regarding management, justice) 6. Health and well-being (general health perceptions, burnout, stress) (Pejtersen, Kristensen, Borg, and Bjorner, 2010). As the authors themselves point out, the COPSOQ is not just a mere questionnaire, it is, among other things, an instrument for improving working conditions. In fact, it is a tool that aims to assess the conditions to which workers are exposed in real work contexts, with a view to designing remedial interventions (Bjorner, Albertsen, and Rugulies, 2010).

3. Meaning in Life (PIL-Test) (Crubaugh and Maholich, 1964; Harlow, Newcomb and Bentler, 1987; Peralta, 2001; Peralta and Silva, 2003). The PIL-Test aims to assess the degree of existential emptiness,

and one's level of self-realization and appreciation of the meaning in life, based on Frankl's (2004) formulation of the construct. "The original scale of "Purpose in Life Test" (PIL) with 20 items have two dimensions (the affective component – experience dimension, and the cognitive component – existential dimension). We used 4 items to measure the "Meaning in life" and focused on the items that translate a normative and non-pathological perspective, two items considering the experience dimension and the other two considering the existential dimension."

Translated and adapted for the Portuguese population, that is, for older adults (Peralta, 2001; Peralta and Silva, 2003), this instrument consists of 20 items, assessed on 7-point Likert-type scales measuring three dimensions or factors: 1. Meaning 2. Will to live 3. Happiness. Considering that meaning, is the most robust dimension of this instrument, focused on a normative, non-pathological perspective, the authors' chose only to privilege this one.

Procedure

Several organizations located in different areas of Portugal were contacted to help with the data collection. These included, among other entities, senior universities, unions, businesses, municipalities, day-care centres, and NGOs working with people in the age range of the study. In all, 19 institutions participated in the data collection. The questionnaire was, in parallel, made available online. Although 1352 answers were obtained, only 1330 were fully completed, 62% returned paper and pencil versions, and 38% electronic versions.

The questionnaire, self-administered, anonymous and confidential, was approved by the ethics committee of the ARSLVT/Health Ministry pro.023/CES/INV/2014.

Finally, as the instrument incorporates work-related issues, retired respondents were asked to report on their last work experiences.

Results

Confirmatory Factor Analysis

A Confirmatory Factor Analysis (CFA) was conducted to validate the measurement model. The measurement model provided goodness of fit with $X^2 = 810.002$, df = 238, $X^2/df = 3.4033$, comparative fit index (CFI) = 0.985, Tucker Lewis index (TLI) = 0.954, incremental fit index (IFI) = 0.986 and root mean square error of approximation (RMSEA) = 0.071 (Hair et al. 2006).

To assess multicollinearity of data, several regression models on the constructs to calculate the VIF (Variance Inflation Factor) were carried out. The VIF values ranged from 1.24 to 2.03, which are considered unproblematic (Kleinbaum *et al.*, 1988). Items with factor loadings below 0.5 were

eliminated (Hair et al., 2006). All items were significantly linked to their corresponding latent factor with standardized regression weights ranging from 0.683 to 0.914. The items with factor loading above 0.5 are eliminated from the measurement model according to the recommendations from Hair et al. (2006) and Bagozzi and Yi (1988). All items of emotional demands has factor loading above 0.5 showing that this dimension was not important for the object of the study. Tests of reliability and convergent and discriminant validity were also undertaken. Reliability was assessed through Cronbach's *alpha* (α) (Hair *et al.*, 2006), convergent validity through composite reliability (CR) and average variance extracted (AVE) (Hair et al., 2006), besides discriminant validity was achieved as all the pair-wise inter-construct correlations were lower than the square root of the AVEs (Fornell and Larcker, 1981). A summary of the results related to reliability, and convergent and discriminant validity can be seen in Tables I and II.

"A Confirmatory Factor Analysis (CFA) were performed to assess the measurement model. The items with factor loading < 0.50 were eliminated. Then, with respect to the "Demands at work" dimension, the items about the emotional demands are deleted. In the "Interpersonal relations and leadership", we only consider the items regarding the leadership. We do not include the "work-individual interface" dimension in our study. And, finally, in the "Health and well-being" dimension, we only consider the items about the stress and the burnout."

(Insert Tables I and II)

Structural Equation Model

Structural Equation Modelling (SEM) with AMOS 21.0 was used to test the hypotheses proposed in the conceptual model. The results provided good fit indices with $X^2 = 898.269$, df = 247, X2 (247) = 3.6367, p < 0.001~~X^2/df = 3.6367~~, CFI = 0.955, TLI = 0.924, IFI = 0.956 and RMSEA = 0.077. The conceptual model explains the 21.2% variance of the meaning of life (ML) and the 16.4% variance of stress and burnout (S_B). The results of the hypotheses tested are in Table III.

(Insert Table III).

The data supported all the hypotheses. Quantitative demands (QD) positively influenced stress and burnout (S_B) (β = 0.173, p < 0.001), as expected, supporting H1. Work pace (WP) positively influenced stress and burnout (S_B) (β = 0.356, p < 0.001), as expected, supporting H2. Work organization and job content (WO_JC) negatively affected stress and burnout (S_B) (β = - 0.130, p < 0.001), as expected, supporting H3. A similar result was obtained between values at work and leadership (VW_L) and stress and burnout (S_B). Values at work (VW_L) and Leadership negatively affected stress along with burnout (S_B) (β = -0.152, p < 0.001), as expected, supporting H4. Finally, the data also supported H5 because stress and burnout felt by individuals increased feelings of dissatisfaction

with life; that is, stress and burnout (S_B) positively affect meaning in life (ML) ($\beta = 0.648$, $p < 0.001$), as expected, supporting H5.

A post-hoc analysis was done to analyze if the model shows different results without the retired respondents. For that the pool data was divided into separate covariance matrices of total (n = 1330) and active workers (n = 684). The base model was defined as the unconstrained model, where all the paths are free to vary across both groups. First the factorial invariance of the models was confirmed ($\Delta\chi^2(df) = 33.924 < \Delta\chi^2_{0.95}(22) = 38.124$) when comparing the unconstrained model with the measurement weights assuming that the unconstrained to be correct. Assuming the model unconstrained to be correct and comparing with the model with structural variances fixed ($\Delta\chi^2(df) = 104.791 < \Delta\chi^2_{0.95}(84) = 111.852$) it is also verified that the adjustment qualities of the unconstrained model with the fixed structural covariance do not differ significantly, showing the invariance of the factorial model for the two groups (total vs. Active workers). The chi-square difference test provides no significant results, and the path coefficients were not significantly different across groups ($\Delta\chi2\ (1) = 3.21$, $p < 0.001$). Indeed, the path coefficients regarding the relationship between the independent variables (quantitative demands, work organization and job content, values at work and leadership and work pace) and stress and burnout does not show statistically significant differences and the same occurs between stress and burnout and meaning of life.

Discussion

This study aimed to explain the impact of quantitative demands and work pace, organization and job content (its influence at work and development), as well as leadership and values in the workplace (social support from supervisors, recognition, trust in management and justice) have on health (stress and burnout). We also explore in to what extent health conditions influence the meaning in life in the last period of the worker's career. It is clear that exposure to harmful working conditions puts the health of workers at risk and, as Yamada, Matsudaira, Irmano, Kitamura and Iso (2016) showed, that psychosocial factors also have a clear influence on the quality of life. In corroboration of the multiple studies presented (García, Inglesias, Saleta and Romay, 2016; Malasch and Leiter, 2008; Kokoroko and Sanda, 2019), when exposed to psychosocial risks, such as high quantitative demands and high work pace, participants showed higher levels of stress and burnout. In fact, research in the context of work and organizations has shown that the quality of the work environment, to which workload, autonomy and active participation of workers contribute, and the nature of relationships and leadership in the workplace, are paramount for well-being (Zábrodská *et al.*, 2014). As Hiesinger and Tophoven (2019) point out, high psychosocial workload negatively affects physical and particularly mental health among older workers.

Inversely, work environments that encourage participation and provide experiences that enhance development are associated with lower levels of stress and burnout. When workers believe that their work and effort are recognized that they are supported by management, they have confidence in the organization's management, and that they work in an environment where justice prevails, their levels of stress and burnout are positively affected. Sousa, Cabral and Batista (2019) also concluded that physical and mental exhaustion are clearly related to work overload and lack of recognition.

Although some studies show the mediating role that individual characteristic can have in the way stressful work situations are handled, for example, by one's ability to trigger emotion regulation strategies (Hirschle, Godim, Alberton and Ferreira, 2019), that is, due to stress mindset (Casper, Sonnetag and Tremmel, 2017) or personality characteristics (Vaz Serra, 2000), the effects of psychosocial risks on workers' health are indisputable.

The literature also corroborates the link between stress and emotional exhaustion, that is, burnout, resulting from high demands and low social support (Esteves, Leão and Alves, 2019). In this sense, and following the JD-R theory, interventions at the level of burnout can be beneficial, that is, if levels of demand are addressed (such as by being given a reasonable workload) and adequate resources are made available (that is, the possibility of being able to influence one's work, to benefit from recognition and effective leadership) (Hakanen and Bakker, 2016).

The results of the previously mentioned studies are useful for understanding the impact of these variables on workers' health and well-being. Nonetheless, the real conditions to which workers are subject in the workplace still seem to be unclear. The means in which this issue has been dealt with contributes to the problem itself, even in the political and legislative domain, but mainly with regard to the prevention practices that have been implemented in diverse work contexts, and which seem to have, predominantly, been guided by individualization, prescription and accountability, rather than by systemic and ecological perspectives (Torres, Gaspar and Lobo, 2016). On the other hand, it is important to understand how these effects are felt in older populations, given the need to prolong active life and ensure active aging.

In fact, psychosocial occupational risks related to job characteristics and interpersonal relationships at work influence health from a bio-psycho-social perspective. The reduction or effective management of psychosocial risks at work should be a priority for the well-being of professionals and organizational well-being. Specifically, the risks related to stress and burnout have a special impact on the health and performance of the worker and, in more serious situations, can even jeopardize their competence, ability, and enjoyment of the work itself. These aspects gain even more relevance when we approach older workers in the retirement process. This is a life event that can be a risk to the overall health of individuals. Many professionals when they retire lose social support, routines, time occupation, perceived competence, participation and even meaning in life. This study is an important contribution to better understand relationship between psychosocial risk factors at work, health and meaning of life

of professionals in the process of retirement. The results allow us to understand relationships and their strengths. On the one hand, we understand that psychosocial risks at work have a negative impact on the health and meaning of life of older professionals, that these risks have a negative impact on the later working life but can also negatively influence the retirement stage. Psychosocial risks at work can have a cumulative and long-term effect that will influence the way the individual will adapt to retirement, the social and emotional competencies with which they will face this stage: if they are weakened can influence their physical and psychological health and the meaning of life.

Considering the main goals of the United Nations 2030 Agenda for sustainable development, this study contributes, namely, to the 3rd one "Ensure healthy lives and promote well-being for all at all ages" and the 8th one "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (United Nations, 2015, pp14). Deepening knowledge related to the condition in which older people work and at their health, contributes not only to more productive organizations, to less spending of public money on health, but also to a more inclusive society. Bearing in mind workers are progressively retiring later and that the exposure to certain work conditions during the late career is problematic for organisations and for society in general, this study has practical and social implication**.**

In view of the above, the implementation of a systemic and ecological approach (Amalberti, 1996, 2003, cited in De la Garza & Poy, 2009) with regard to occupational health and prevention practices becomes a priority. This implies the definition of a prevention plan that considers the participation of different agents, of different organizational levels and with different ages and professional experiences. Health prevention should take place within in a multilevel perspective, crossing cognitive and psychophysiological characteristics of workers, workplace and technical resources, the collective of workers and also the organization itself.

A specific and systematic intervention in the preparation of the retirement process through the reduction or promotion of effective management of psychosocial risks in the work of older workers, preparation and promotion of socio-emotional skills and retirement planning through the readaptation of the meaning of life, promoting more participation and empowered older people with a more active role in their lives and in society.

Some authors have maintained that age can create a buffer against the negative effects of workload, through increased maturity and emotional regulation (Mauno, Ruokolainen and Kinnunen, 2013, *cited in* Mäkikangas, Kinnunen, Feldt and Shaufeli, 2016, p 49). It may also be that, on the one hand, working retirees will tend, at the outset to be in reasonable health given that they are engaged in some form of occupation. Conversely, retired respondents could have had difficulty reporting on their last work situations. Considering that the COPSOQ is an instrument conceived for active people, this may be a limitation to the study. Future research may be addressed by qualitative or mixed methodologies, which might provide a more comprehensive understanding of this phenomenon. Due to fluctuations in feelings

of exhaustion, cynicism and professional inefficacy, Hakanen and Bakker (2016) suggested that qualitative methodologies could potentially look into burnout, for example, through diary studies. Conversely, as Kooj, Lange, Jansen and Dikkers (2013) argued, occupational well-being studies should take into account not only the chronological age of participants, but also the perception that older workers have of their own health statuses. In this sense, understanding the meaning that humans attribute to work, dynamically, throughout their lives, and the way they manage and develop their health, through the (re)definition of norms and values (Canguilhem, 2002; Schwartz, 2000), might lead us to conduct future research using an Activity-oriented Approach to Ergonomics (Daniellou, 2005; Daniellou and Rabardel, 2005; Guérin *et al*., 2001).

Another possible limitation of this research may be associated with the results that could translate specificities of the Portuguese reality. Also the sample shows some gender imbalance, with 62% being female and 38% male.

The sample size is a strength, the fact that the sample is national including participants from different parts of the country may be a strength but may also have conditioned the results, once SEM's have been used. The challenges facing human resource management today, and the various actors involved in occupational health issues, place particular emphasis on the psychologist in the workplace. Nevertheless, designing and maintaining healthy, sustainable workplaces will involve dialogue and a strong commitment on the part of the various organizational stakeholders, along with national and international policies. This will involve studying age as well as its related critical factors, not only at the individual level, but also at the governmental, societal and organizational levels of our modern aging world, and developing measures to address its consequences. This idea has been propounded by the World Bank (2012, *cited in* Ismail, Fauzi, Shamsuddin, Hadi, Azid and Razali, 2013, p. 933), which stressed that the relationships between psychosocial factors and health risks are important not only at individual level, but also at organizational level, as they affect organizational productivity and, concomitantly, nations themselves. Recognizing that, in the organizational context, the meaning in life is not yet a fully explored construct (Ward and King, 2017), the present study seeks to make a contribution towards a better understanding of its relationship with health and well-being, which will have repercussions for levels of job satisfaction and performance, not only for the individual, but also for organizations. We believe that the present study is innovative by studying the effect that health itself has on meaning in life, as few research has examined this effect. We also suggest that longitudinal research should be developed in this field of knowledge, given that the effects of exposure to certain working conditions are only felt long-term, and that the need to work until later in life is indubitable, specifically, since we need to work longer, we should explore means of doing so while maintaining good health. This will involve the adoption of a different theoretical viewpoint based on the long-term development of employee well-being, using, for example, the conservation of resources model, which argues that "… people are motivated to gain, maintain, and accumulate resources – which can be anything that is either valuable

in its own right or importance for protecting other resources or attaining future goals… It also assumes that the relationship between different resources is mutual and dynamic in nature" (Hobfoll, 1989, 2002, *cited in* Mäkikangas, Kinnunen, Feldt and Shaufeli, 2016, p. 49). In fact, considering the results obtained in this study, we believe that future research would benefit from a longitudinal approach, accompanying workers throughout the last stage of their career and after entering retirement. This approach would benefit even deeper insights into how the effect that job demands affect health and how those demands can explain health inequalities. In addition, future analysis could also use the sociodemographic factors as control variables

The meaning of life is one of the most important factors contributing to healthy and active aging. The quality of working life and the psychosocial risks of work in the later years of active working life will condition the retirement and aging process. Health from a bio-psycho-social perspective influences and is influenced by the work situation, namely physical health, mental health, work stress, and acceptance and integration in the workplace.

Work contributes to mental health and chronic health problems, policies to promote working longer and to reduce the incidence of early exit from the workforce need to focus on prevention and helping those with chronic conditions to actively function at work.

In conclusion, the results of the study confirm the relationship between psychosocial risks at work and stress and burnout as well as the relationship between health and the meaning of life in older workers. This leads us to reflect on the relevance of identifying, minimizing, and managing psychosocial risks at work in order to reduce work stress and burnout and promote a sense of meaning in life. In relation to older workers, this relationship is even more relevant since retirement is a potentially risky life event for people's health and meaning of life. We believe that the promotion of socioemotional competencies, the implementation of an integration strategy, and a progressive retirement process are important aspects to reduce the psychosocial risks in the last years of work, reduce stress and burnout, and promote a more positive and active retirement process with less risk to bio-psycho-social health.

Conflict of Interest

The authors of this article declare no conflict of interest.

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